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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,332	12/24/2001	Yong Wang	12860-E CIP	3250

7590 02/13/2004

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EXAMINER

HOPKINS, ROBERT A

ART UNIT

PAPER NUMBER

1724

DATE MAILED: 02/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/036,332

Applicant(s)

WANG ET AL.

Examiner

Robert A Hopkins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 1-5,7-18,30 and 31 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-22,24 and 26-29 is/are allowed.
- 6) ☒ Claim(s) 6 is/are rejected.
- 7) ☒ Claim(s) 19,23 and 25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8-6,3-21.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of claims 19-29 in Paper dated 1-14-2004 is acknowledged. As noted in the restriction requirement, the product claim(claim 6) is also being examined along with claims 19-29.

Claims 1-5,7-18, and 30-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group 1. Election was made **without** traverse in Paper dated 1-14-2004.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

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Claim 6 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by Chen et al(6495258).

Chen et al teaches a porous carbon nanotube structure comprising a large pore support(column 3 lines 48-52, column 5 lines 39-67, column 6 lines 1-18), and carbon nanotubes disposed over the large pore support.

***Allowable Subject Matter***

Claims 19,23,25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 19 recites "a method of adsorbing a chemical component comprising: contacting the structure of claim 6 with a chemical component whereby the chemical component is adsorbed on the surface of the structure. Chao et al(US 2003/0152759) discloses a method of fabricating nanostructured materials using a pore surface of mesoporous silica, wherein the mesoporous silica serves as a host for template synthesis of nanostructured materials. However, Chao et al does not disclose using a pore support with carbon nanotubes disposed over the pore support, and also does not disclose contacting carbon nanotubes with a chemical component for adsorption of the chemical component. Also, the filing date of Jan 29, 2002 does not predate the applicant's date of 12-21-01. Bakajin et al(2004/0007528) discloses using a silica substrate and carbon nanotubes disposed over the silica substrate, wherein the carbon nanotube mesh is as a separation, concentration, or filtration medium. However the filing date of July 3, 2003 does not predate the applicant's date of 12-21-01. It would

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not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a step of contacting the structure of claim 6 with a chemical component because neither Chao et al nor Bakajin et al suggest such a modification.

Claim 23 recites "a method of separating a component comprising: contacting the structure of claim 6 with a mixture whereby the structure of claim 6 separates at least one component from the mixture. As noted in the above response to claim 19, It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a step of contacting the structure of claim 6 with a mixture whereby the structure of claim 6 separates at least one component from the mixture because neither Chao et al nor Bakajin et al suggest such a modification. The reasons are identical to those discussed with regard to claim 19. Claim 25 depends on claim 23 and hence would also be allowable upon rewording claim 23 as an independent method claim, substituting the claim language of claim 6 for "claim 6" in claim 23.

Claims 20-22,24, and 26-29 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 20 recites "contacting a carbon nanotube-containing structure with a chemical component whereby the chemical component is adsorbed on the surface of the structure; wherein the carbon nanotube-containing structure comprises a support, carbon nanotubes disposed over the support, and a mesoporous silica layer disposed between the support and the carbon nanotubes. Chao et al(US 2003/0152759) discloses a method of fabricating nanostructured materials using a pore surface of

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mesoporous silica, wherein the mesoporous silica serves as a host for template synthesis of nanostructured materials. However, Chao et al does not disclose using a pore support with carbon nanotubes disposed over the pore support, and also does not disclose contacting carbon nanotubes with a chemical component for adsorption of the chemical component. Also, the filing date of Jan 29, 2002 does not predate the applicant's date of 12-21-01. Bakajin et al(2004/0007528) discloses using a silica substrate and carbon nanotubes disposed over the silica substrate, wherein the carbon nanotube mesh is as a separation, concentration, or filtration medium. However Bakajin et al does not disclose using a mesoporous silica layer disposed between the support and the carbon nanotubes. Also, the filing date of July 3, 2003 does not predate the applicant's date of 12-21-01. Pfefferle et al(2003/0148086) discloses using a mesoporous silica framework for the templated growth of carbon nanotubes, however Pfefferle et al does not disclose using a mesoporous silica layer disposed between a support and the carbon nanotubes. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a step of contacting a carbon nanotube-containing structure with a chemical component whereby the chemical component is adsorbed on the surface of the structure; wherein the carbon nanotube-containing structure comprises a support, carbon nanotubes disposed over the support, and a mesoporous silica layer disposed between the support and the carbon nanotubes because neither Chao et al nor Bakajin et al nor Pfefferle et al suggest such a modification. Claims 21, 22, and 28 depend on claim 20 and hence are also allowed.

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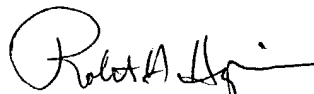
Claim 24 recites "contacting a carbon nanotube-containing structure with a mixture whereby the structure separates at least one component from the mixture; wherein the carbon nanotube-containing structure comprises a support, carbon nanotubes disposed over the support, and a mesoporous silica layer disposed between the support and the carbon nanotubes. As noted in the above response to claim 20, It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a step of contacting a carbon nanotube-containing structure with a mixture whereby the structure separates at least one component from the mixture; wherein the carbon nanotube-containing structure comprises a support, carbon nanotubes disposed over the support, and a mesoporous silica layer disposed between the support and the carbon nanotubes because neither Chao et al nor Bakajin et al nor Pfefferle et al suggest such a modification. The reasons are identical to those discussed with regard to claim 20. Claims 26,27, and 29 depend on claim 24 and hence are also allowed.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert A Hopkins whose telephone number is 571-272-1159. The examiner can normally be reached on Monday-Friday 9:00am-4:00pm, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on 571-272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Robert A Hopkins  
Primary Examiner  
Art Unit 1724

Rah  
February 6, 2004